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CLAIMS:

1. A flat-panel wide-field-of-view projection display comprising a disc-shaped, circularly symmetric lens (1) collimating light from points in a focal circumference around the disc, and an array of light emitters (2; 3, 4), positioned along the focal circumference of the circularly symmetric lens so that light rays from each of the light emitters are substantially collimated by the lens in the plane of the lens in a different direction from its neighbouring light emitters; a light modulator (4; 15; 20); and a ray-diverting means (7; 11; 19) for ejecting the collimated light out of the plane of the lens and towards a viewer.

2. A projection display according to claim 1, in which the ray-diverting means includes a rotating prismatic reflector (19), and a selecting means is present for synchronizing the rotary position of the reflector with the modulation of the light.

3. A projection display according to claim 1, in which the ray-diverting means comprises a flat panel of material parallel to the plane of the lens.

4. A projection display according to claim 3, further comprising line-selecting means associated with the panel for selecting one line at a time of an image from the array of light emitters so as to display that line.

5. A projection display according to claim 4, in which the ejection is by deflection of the rays from the panel at the selected line.

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5 6. A projection display according to claim 5, in which the panel includes a reflective sheet (5) and the selecting means is a transducer (6) for producing a localized, linear, acoustic or surface wave in the sheet, the presence of the wave at a given position causing reflection of the ray.

10 7. A projection display according to claim 5, in which the panel is a waveguide (10) into which light from the lens is injected.

15 8. A projection display according to claim 7, in which the ejection means (11) is a diffraction grating, which causes collimated light to travel in a particular direction.

20 9. A projection display according to claim 7 or 8, in which the line-selecting means comprises a layer or strip on the panel or at any other position in the collimated beam of light, which is switchably reflective or transparent; the means for selecting the position at which the rays are ejected being adapted to change the state of the switchable layer.

25 10. A projection display according to any preceding claim, in which each light emitter includes a microdisplay (4) acting as the light modulator.

30 11. A projection display according to claim 10, in which each light emitter comprises a microdisplay and an individual lens (3), arranged so that the microdisplay emits light towards the individual lens; each individual lens being positioned on the focal circumference of the circularly symmetric lens (1).

35 12. A projection display according to claim 11,

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in which each individual lens is cylindrical and separated from the microdisplay by its focal distance.

13. A projection display according to any of claims 10 to 12, in which neighbouring microdisplays each project a complete one-dimensional image, the images differing only in the angle of view or phase.

14. A projection display according to any of claims 10 to 13, in which a frame store is provided for each microdisplay to store successive images of a moving display.

15. A projection display according to any preceding claim, in which the light emitters are point sources, used to display a hologram, or abutting sources, used to display an auto-stereoscopic view.

16. A projection display according to any of claims 3 to 9, in which the light sources are unmodulated and the light modulator is in the form of a switchable strip (15) provided in the path of the collimated rays, between the circularly symmetric lens and the panel, in order to modulate the collimated light.

17. A projection display according to any preceding claim and further including a diffuser (8) positioned after the ray-diverting means in order to narrow the gaps between the beams from adjacent light emitters.

18. A projection display according to any of claims 3 to 17, further including a reflector (9), provided to at least one side of the panel (10) to reflect an outer portion of the image that misses the

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~~panel back towards the panel.~~

19. A projection display according to claim 18,
further including image-processing means adapted to
ensure that the reflected pixels display the correct
part of the image, taking into account the reflection.

20. A projection display according to claim 3,
arranged with the circularly symmetric lens (1) and
panel (5; 10) in substantially the same plane,
preferably the plane in which the light is emitted from
the light emitters.

21. A projection display according to claim 3, in
which the planes in which the panel and lens are formed
are adjacent and parallel, folding means being provided
to fold the optical system so that rays emitted from
the edge of the lens are directed into the panel.

22. A monocentric lens comprising a generally
circular transparent disc whose thickness varies with
radius, and adapted to receive light at the edge of the
disc, the thickness variation being such that light
from points around a focal circumference of the lens
are collimated essentially within the plane of the lens
by total internal reflection as the light travels
across the disc.

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